



QD-PA-002
REVISION E

EFFECTIVE DATE: February 3, 2006

ORGANIZATIONAL INSTRUCTION

MSFC S&MA SHUTTLE PROPULSION PROJECTS SUPPORT

OPR(s)

QD20

OPR DESIGNEE

Tom Hartline

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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		10/22/97	
Revision	A	7/1/99	Changes made to reflect new organization code changes and/or Changes made to reflect new directives renumbering scheme and include disposition for quality records.
Revision	B	9/3/02	Changed numbering scheme to remove department identifier in OI document number, removed "Expires Date", removed signature blocks, in accordance with QS-A-001 revision F.
Revision	C	05/05/03	Updated with editorial changes due to S&MA reorganization into five departments and various out of date information.
Revision	D	10/15/2004	Updated with editorial changes due to S&MA reorganization. Changes to reflect and define procedures using the word "shall".
Revision	E	2/3/2006	Administrative Change - Changed OPR designee

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MSFC S&MA Shuttle Project Office Support

1. SCOPE

1.1 Scope. This Organizational Issuance (OI) addresses those Safety and Mission Assurance (S&MA) Support activities which are performed by Shuttle Assurance Department personnel in support of the Space Shuttle Project Offices.

1.2 Purpose. To establish procedures for the accomplishment of Safety and Mission Assurance Support as it applies to Shuttle S&MA personnel supporting the Space Shuttle Program.

1.3 Applicability. This Office Work Instruction is applicable to all QD20 and mission support contractor personnel that support the MSFC Shuttle projects.

2. APPLICABLE DOCUMENTS (As specified herein)

NPR 1441.1	NASA Records Retention Schedules
NPR 8621.1	NASA Procedural Requirements or Mishap Reporting, Investigating, and Recordkeeping
NPR 8715.3	NASA Safety Manual
NSTS 22206	Requirements for Preparation and Approval of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL)
NSTS 5300.4 (1D-2)	Safety, Reliability, Maintainability, and Quality Provisions for the Space Shuttle Program
NSTS 22254	Methodology for Conduct of Space Shuttle Program Hazard Analysis
NPR 5000.1	Purchasing
MWI 5330.2	NASA Engineering And Quality Audit (NEQA)
MWI 8050.1	Verification of Hardware, Software and Ground Support Equipment for MSFC Projects

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3. DEFINITIONS

Action Item (AI): Task assigned by a Program Manager, Project Manager, Chief Engineer, S&MA Management, or other authority. These tasks are typically short term requirements of limited scope which shall be accomplished within the specified time frame.

Certificate of Qualification (COQ): A form (MSFC 511 or equivalent) used to list the configuration of the hardware and documentation (test reports, analysis reports, failure analysis reports, discrepancy reports, etc.) required to verify that the flight hardware or program critical ground support equipment is qualified for its intended use.

Certification: The process of reviewing, assessing, and formally declaring the adequacy of verification data used to establish qualification status.

Milestone Review: Shuttle Project design review meetings such as (but not limited to): PRR, PDR, CDR and DCR are conducted to evaluate the progress, development and maturity of programs, hardware, systems or processes.

Qualification: The process of conducting formal test and/or analysis on flight configuration hardware or program critical ground support equipment to demonstrate that adequate margins exist to assure that specification requirements are met and that hardware satisfies design, performance and environmental requirements for its intended use.

Where QD20 is referenced in this document, it includes both civil servants and mission support contractors that support QD20.

ACRONYMS

CDR	Critical Design Review
CIL	Critical Items List
COQ	Certificate of Qualification
COTR	Contracting Officer's Technical Representative
CPE	Contractor Performance Evaluation
DCR	Design Certification Review
DR	Data Requirement

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FMEA	Failure Modes and Effects Analysis
FRC	Federal Records Center
LOD	Letter of Delegation
MOU	Memorandum of Understanding
MSP	MSFC System Procedure
NARA	National Archives and Records Administration
NSTL	Non-Supervisory Technical Lead
PDR	Preliminary Design Review
PFRR	Pre-Flight Readiness Review
PRR	Preliminary Requirements Review
TIB	Technical Issues Briefing

4. INSTRUCTIONS

4.1 NASA Engineering and Quality Audits (NEQA). The requirements for MSFC S&MA participation are documented in MWI 5330.2

4.2 Hardware Qualification / Certification. QD20 involvement in the COQ Review and approval process is documented in the enclosed flow chart (Appendix A). The Shuttle Assurance Office involvement in the Hardware Qualification / Certification process is specified in MWI 8050.1.

4.3 Project Milestone Reviews. QD20 involvement in the Project Milestone Review process is documented in the enclosed flow chart (Appendix B).

4.4 S&MA and Data Requirement (DR) Revisions. This section identifies the process and responsibilities for assuring that revisions to Safety and Mission Assurance (S&MA) requirements and contractual Data Requirements (DR) are properly reviewed and approved from the S&MA perspective. The QD20 involvement in the S&MA and DR Revision process is documented in the enclosed flow chart (Appendix C) and is described as follows:

The Shuttle Contractor shall prepare the proposed revision and submits it by letter to the appropriate Contracting Officer at MSFC. The Contracting Officer shall distribute copies of the proposed revision to the corresponding QD20 Team Lead and other required reviewers.

QD20 personnel shall review the proposed change. Evaluation of the change for impact to: Hazard Analyses (per NSTS 22254);

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Failure Modes and Effects Analyses and Critical Items Lists (per NSTS 22206); or other requirements and controls of primary interest to S&MA (per NSTS 5300.4 (1D-2)). The purpose of this review is to insure that S&MA requirements are not deleted or amended without acceptable justification. A secondary purpose of the review is to assess the acceptability of the proposed change from an overall Project point of view. Editorial changes may also be recommended as a result of this review.

Expert advice regarding the proposed change may be solicited from contractor personnel, other Project personnel, the S&MA community or other appropriate sources. If changes to the proposed revision are identified, they may be coordinated with interested parties on an informal basis. As a result of this coordination, the contractor may submit a revised version of the original revision. The QD20 Team Lead shall forward the S&MA recommendation to the Project office. The Project office shall submit the final authorizing document to the Contracting Officer. The Contracting Officer shall submit the contract modification document to the Contractor which responds to the latest version of the request for an S&MA requirement or DR revision. Possible dispositions include approval as written, approval with comments or disapproval.

4.5 Mishap and Failure Investigation Support. Mishap is defined as any unplanned occurrence, event, or anomaly that meets one of the criteria of Type A, B, or C Mishap, Mission Failure, and Incident. Injury to a member of the public while on NASA facilities is also defined as a mishap. Types A, B, C mission failure and incident are defined in Chapter 1 of NPR 8621.1. Investigations are conducted in accordance with NPR 8715.3 and NPR 8621.1. Incidents or problems that do not fall into the category of Type A, B, or C Mishaps may also require a failure investigation to determine cause, corrective action, recurrence control, and flight rationale (either direct effect or a generic effect on the fleet). QD20 involvement in the Mishap and Failure Investigation process is documented in the enclosed flow chart (Appendix D).

4.6 Contractor Performance Evaluation. The requirements for Shuttle and S&MA Mission Support Contractor Performance Evaluation (CPE) are specified in the Performance Evaluation Board plan issued by the Project Manager or COTR. MSFC requirements for CPE are specified in NPR 5000.1. QD20 involvement in the CPE process for Shuttle Contractors is

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documented in the enclosed flow chart (Appendix E). QD20 involvement in the CPE process for S&MA Mission Support Contractors is documented in the enclosed flow chart (Appendix F).

4.7 Action Item (AI) Processing. This section addresses the accomplishment of action items assigned to QD20 by a Program, Project or other authority. Detailed instructions for the accomplishment of action items widely vary. Differing requirements require action items to be resolved on a case by case basis. This section provides generic suggestions of guidelines for the actions necessary to ensure the proper closure of action items.

Most formal actions are received by the QD20 supervisor or NSTL and are assigned to Office personnel for closure. Others may be assigned to workers directly on an informal basis. Written actions require a written response. Verbal actions may either be closed verbally or in writing depending on the circumstances and importance of the action. Written responses should be submitted in all cases when not otherwise specified. Responses should fully address the action and clearly resolve all anticipated questions from management, originators or other reviewing parties. The format and content of the AI response should represent the level of technical familiarity of the originator.

4.8 Technical Issues Briefing for Flight Readiness Review. The Director of the MSFC is a member of the Space Shuttle Program Level I/II Flight Readiness Review (FRR) Board that convenes at the KSC prior to each space shuttle mission. The MSFC Director has requested, as a minimum, that a briefing from S&MA and Science and Engineering personnel on MSFC technical issues that are to be presented at FRR be conducted. A Memorandum of Understanding (MOU) (March 12, 1992 and signed by the Director of the S&MA Office and the Director of Science and Engineering) defines the responsibilities of S&MA and S&E in conducting Technical Issues Briefings.

4.9 Project Pre-Flight Readiness Review. The QD20 Team Lead is a member of the Space Shuttle Project Preliminary Flight Readiness Review (PFRR) Board that convenes at the MSFC prior to each space shuttle mission. The QD20 Team Lead shall be responsible for independent S&MA assessment of all technical issues that are to be presented at FRR. QD20 personnel conduct

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review and evaluation of all applicable elements of the FRR prior to the FRR Board. Flight Rationale submitted by the Shuttle Contractor for all Technical Issues shall be deemed adequate as condition for the QD20 Team Lead (or designee) signature.

Typical elements of PFRR include (but are not limited to):

- Flight Hardware Configuration
- Flight/Hotfire History
- Performance Predictions
- Prior Flight/Ground Test Anomalies
- Technical Issues
- Flight System Safety Risk Assessment
- Quality Assessment
- Reliability Assessment
- Open Work Disposition
- Exceptions to the Certification of Flight Readiness (COFR)

4.10 Letters of Delegation. Letters of Delegation (LOD) for Government Agency Contracts Quality Requirements are generated by the appropriate QD20 Team Lead. The LOD is transmitted by that Project's Contracting Officer.

5. NOTES

5.1 Directive Replacement. This Directive replaces QD-PA-002, Revision C, MSFC S&MA Shuttle Project Office Support.

6. SAFETY PRECAUTIONS AND WARNING NOTES

None

7. APPENDICES, DATA, REPORTS, AND FORMS

- Appendix A Hardware Qualification/Certification Process Flow Chart
- Appendix B Milestone Review Process Flow Chart
- Appendix C Data Requirement Revision Process Flow Chart
- Appendix D Mishap and Failure Investigation Process Flow Chart
- Appendix E Shuttle Contractor Performance Evaluation Process Flow Chart

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Appendix F Mission Support Contractor Performance Evaluation
Process Flow Chart

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8. RECORDS

Records are maintained as specified in the following table.

<u>Record</u>	<u>Repository</u>	<u>Period of Time</u>
8.1 NEQA Review Items and Reports OPR: QD10	Hard Copy	NPR 1441.1, NASA Records Retention Schedules 8/10 Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA.
8.2 Certifications of Qualification OPR's: QD20 SSME Team Lead QD20 SRB Team Lead QD20 RSRM Team Lead QD20 ET Team Lead	Hard Copy	NPR 1441.1, NASA Records Retention Schedules 8/10 Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA.
8.5a Mishap Report OPR: QD20	Hard Copy	NPR 1441.1, NASA Records Retention Schedules 8/10 Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA.

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8.5b Failure Investigation Documentation OPR: Applicable Project Office	Hard Copy	NPR 1441.1, NASA Records Retention Schedules 8/10 Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA.
8.6 Performance Evaluation Board Documentation OPR: Project PEB Secretariat	Hard Copy	NPR 1441.1, NASA Records Retention Schedules 8/10 Retain records at MSFC until completion, cancellation, or termination of the project. Retain or retire records to an FRC for 10 years then transfer to NARA.

9. TOOLS, EQUIPMENT, MATERIALS

None

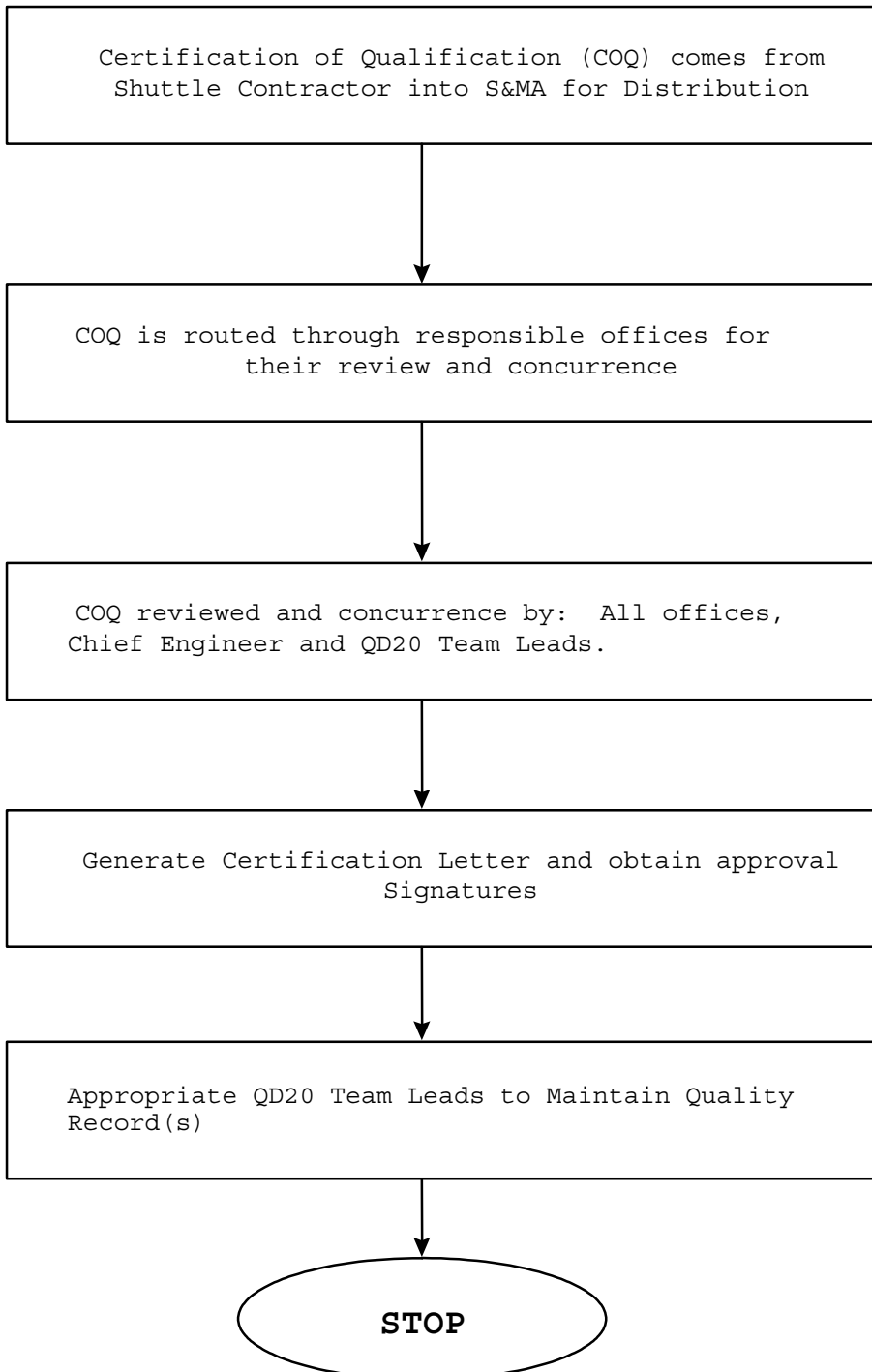
10. PERSONNEL TRAINING AND CERTIFICATION

None

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APPENDIX A

Hardware Qualification/Certification

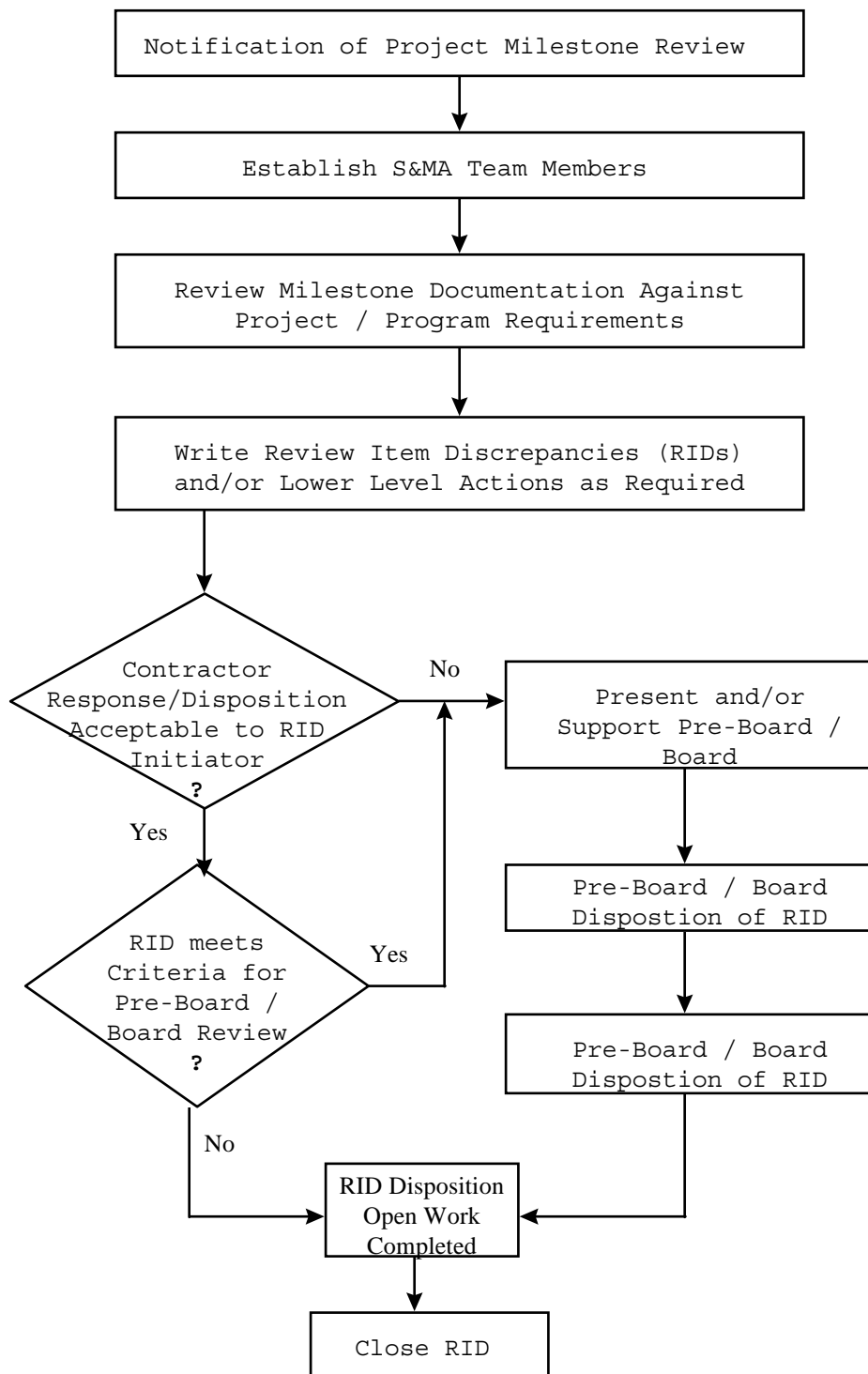


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APPENDIX B

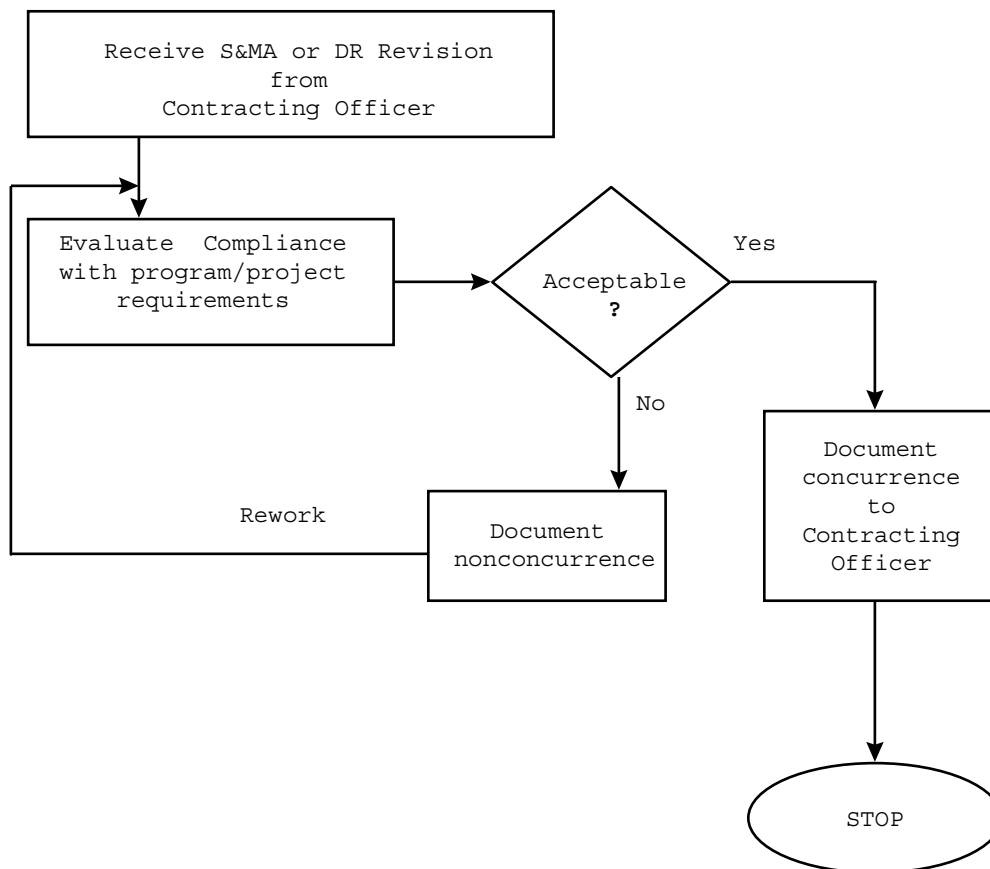
Milestone Review



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APPENDIX C

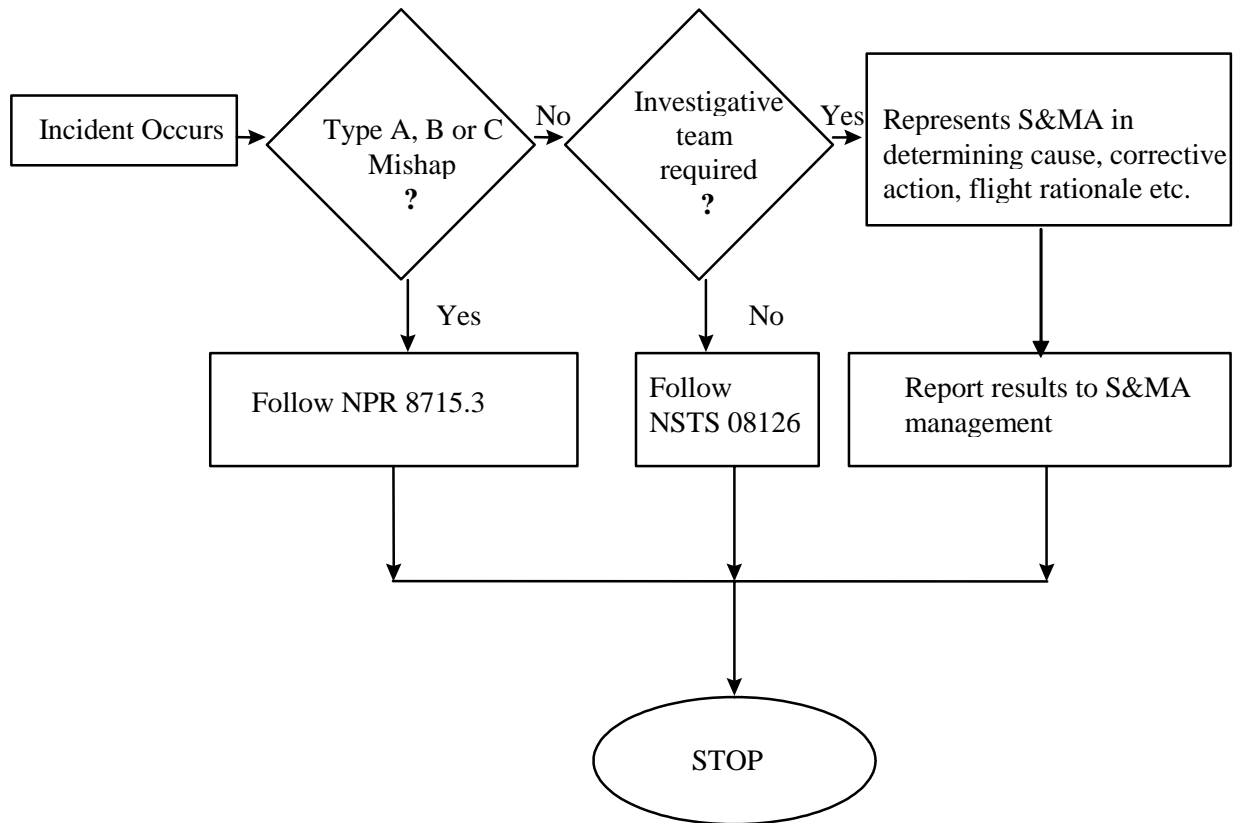
S&MA and Data Requirement (DR) Revisions



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APPENDIX D

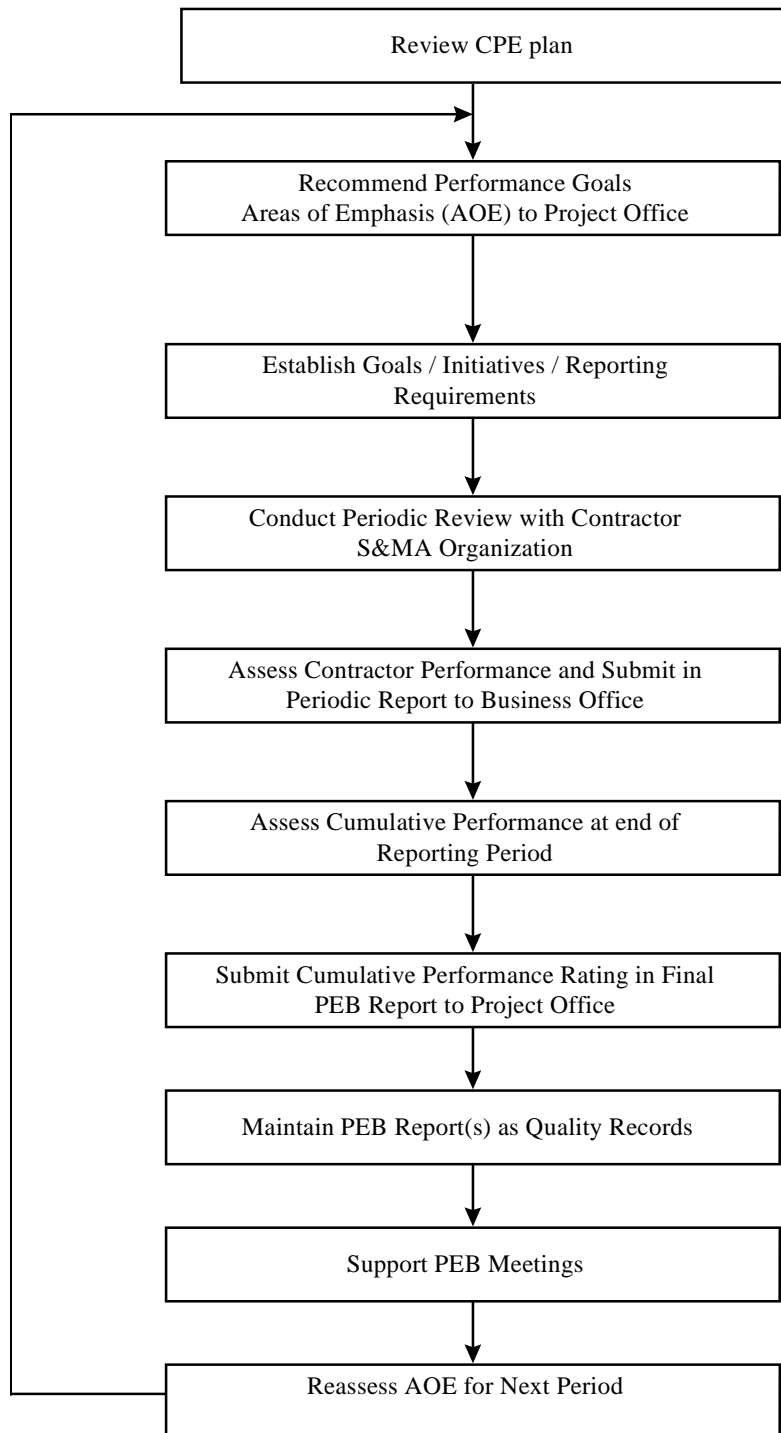
Mishap and Failure Investigation



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APPENDIX E

Shuttle Contractor Performance Evaluation (CPE)



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APPENDIX F

S&MA Mission Support Contractor Performance Evaluation (CPE)

